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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/646,589 | 08/21/2003 | Sang Su Lee | 2013P099 | 9953 |
| 8791 | 7590 | 03/27/2007 | EXAMINER | |
| BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD SEVENTH FLOOR LOS ANGELES, CA 90025-1030 | | | SHIFERAW, ELENI A | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2136 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE | | |
| 3 MONTHS | 03/27/2007 | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/646,589 | LEE ET AL. | |
| | Examiner | Art Unit | |
| | Eleni A. Shiferaw | 2136 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 09 March 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed..
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 09 March 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 - Certified copies of the priority documents have been received in Application No. _____.
 - Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
 Paper No(s)/Mail Date 08/21/2003
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

1. Claims 1-10 are presented for examination.

Information Disclosure Statement

An Initialized and dated copy of Applicant's IDS form 1449 is attached to the instant Office action.

Drawings

2. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because figure 13 is a square box and no legend. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-10 are rejected under 35 U.S.C. 102(a) as being anticipated by Lee et al.

“Visual Cryptography Based on an Interferometric Encryption Technique”.

Regarding claims 1 and 5, Lee et al. discloses an apparatus for cryptography an image, comprising:

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an image segmenting unit that segments an input binary image into images (fig. 1 element (a); fig. 6 image divisions);
a random image generating unit (fig. 6; *random generator*) that generates as many random images as the segmented images (page 373 col. 2 par. 2);
a cryptographing unit that performs XOR operations on the segmented images and the random images on a one-to-one basis to produce as many cryptographed images as the segmented images (page 376 section III and fig. 6; *XORing slide images and random key(s)*); and a phase card generating unit that assigns phase values of π and 0 to black and white pixels of the cryptographed images to generate phase cards corresponding to the cryptographed images (page 376 section III numbers 1-2 and fig. 6; *assigning phases... 0 to white and pi to black*).

Regarding claim 9, Lee et al. discloses an apparatus for deciphering an image, comprising:

a light source that outputs a linearly polarized beam with a short wavelength (fig. 14; *He-Ne Laser*);
a polarized beam splitter that splits the linearly polarized beam into two linearly polarized orthogonal beams (fig. 14 BS1 *vertical and horizontal linearly polarized beams*);
a first mirror that reflects a vertically polarized beam emitted from the polarized beam splitter through a first optical path (fig. 14 *element M1*);
a second mirror that reflects a horizontally polarized beam emitted from the polarized beam splitter through a second optical path (fig. 14 *element M2*);

a beam splitter that combines the vertically and horizontally polarized beams reflected from the first and second mirrors into a beam with a new polarization orientation (fig. 14 *element BS2*); and

a polarizer that transmits only a one-orientation-polarized beam of the combined beam so as to decipher the image (fig. 14; *polarizer transmitting one beam for decryption*), wherein phase cards are generated by assigning phase values of π and 0 to black and white pixels of cryptographed images so as to be respectively located in optical paths between the first mirror and the beam splitter and between the polarized beam splitter and the second mirror (page 378 section IV).

Regarding claim 10, Lee et al. discloses a method of deciphering an image, comprising:

splitting a linearly polarized beam with a short wavelength emitted from a light source into two linearly polarized orthogonal beams (fig. 14 *BS1 splittingvertical and horizontal linearly polarized beams*);

transmitting the two linearly polarized orthogonal beams through phase cards (fig. 14 *element phase mask*) that are generated by assigning phase values of π and 0 to black and white pixels of cryptographed images and located in optical paths through which the two linearly polarized orthogonal beams pass (page 378 section IV);

combining the two linearly polarized orthogonal beams, which have passed through the phase cards, into one polarized beam with a new polarization orientation (fig. 14 *element BS2; combiner BS2*); and

transmitting only a one-orientation-polarized beam of the combined polarized beam so as to decipher the image (fig. 14; *polarizer transmitting one beam for decryption*).

Regarding claims 2 and 6, Lee et al. discloses the method wherein the random image generating unit comprises:

a first random image generating unit (fig. 6; *random generator*) that generates first random images 1 less than the number of segmented images (page 376 section III number 1); and a second random image generating unit that performs XOR operations on the first random images to generate a second random image (page 376 section III number 1-2 and fig. 11).

Regarding claims 3 and 7, Lee et al. discloses the method wherein the generation of the phase cards comprises: etching a transparent medium covered with an etchant to thicknesses corresponding to the phase values assigned to the black and white pixels of the cryptographed images to generate the phase cards (page 378 col. 1 par. 2).

Regarding claims 4 and 8, Lee et al. discloses the method wherein in the generation of the phase cards, the thicknesses of the phase cards are determined using Equations below:

$$D = (\lambda\Phi)/2\pi(n-1)$$

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wherein λ denotes a wavelength of light transmitting through the phase cards, Φ denotes a phase value to be expressed, and n denotes a refractive index of the transparent medium of which the phase cards are made (page 378 col. 1 section IV).

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eleni A. Shiferaw whose telephone number is 571-272-3867.

The examiner can normally be reached on Mon-Fri 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nasser R. Moazzami can be reached on (571) 272-4195. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NASSER MOAZZAMI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

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E.S.